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Reid

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(54) **SECURITY TAG AND METHOD OF MAKING THE SAME**

(75) Inventor: **Jeffrey Reid**, Longford Mills (CA)

(73) Assignee: **1175634 Ontario Limited**, Toronto (CA)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/543,918**

(22) Filed: **Apr. 6, 2000**

Related U.S. Application Data

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(51) **Int. Cl.**[7] **G08B 13/14**
(52) **U.S. Cl.** **340/572.8**; 156/60
(58) **Field of Search** 340/572.8, 572.1; 342/51; 156/60

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,151,405 A		4/1979	Peterson	235/382
4,581,524 A	*	4/1986	Hoekman et al.	340/572.1 X
4,626,311 A		12/1986	Taylor	156/308
4,717,438 A		1/1988	Benge et al.	156/152
5,406,263 A	*	4/1995	Tuttle	340/572.8 X
5,495,250 A	*	2/1996	Ghaem et al.	342/51
5,583,489 A		12/1996	Loemker et al.	340/572
5,614,278 A	*	3/1997	Chamberlain et al.	428/41.4
5,859,587 A	*	1/1999	Alicot et al.	340/572.8
5,982,284 A	*	11/1999	Baldwin et al.	340/572.8

FOREIGN PATENT DOCUMENTS

DE	4323883 A1	1/1995
EP	0446910 A1	9/1991
EP	0858061 A2	8/1998
GB	2310977	9/1997
WO	WO9914717	3/1999

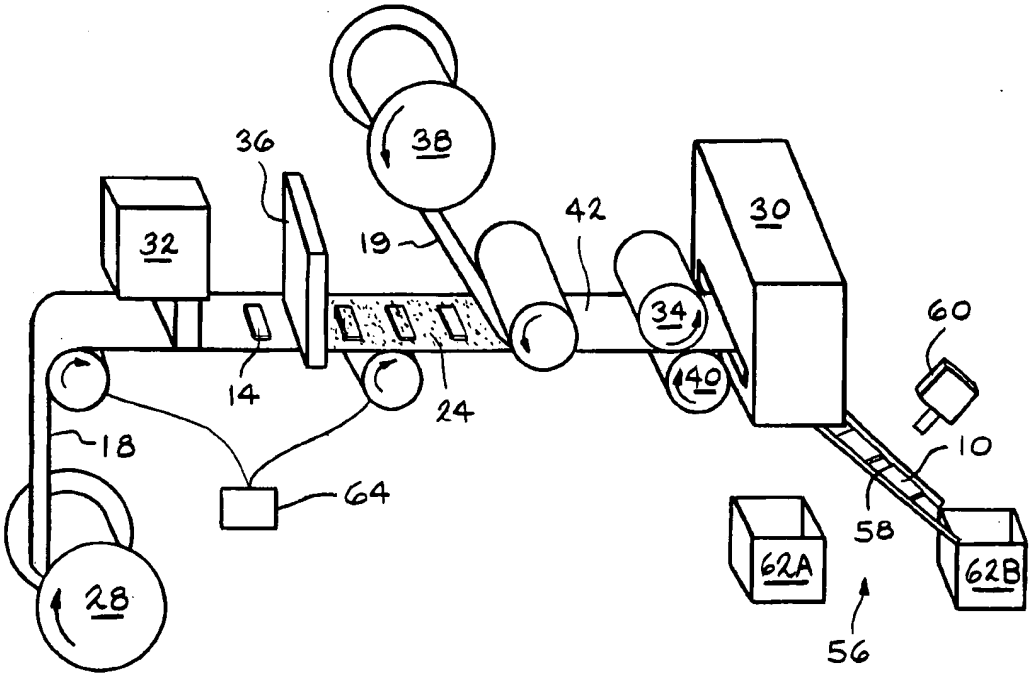
* cited by examiner

Primary Examiner—Thomas Mullen
(74) *Attorney, Agent, or Firm*—Hodgson Russ LLP

(57) **ABSTRACT**

A security tag has two encapsulating strips, with an anti-theft strip between the encapsulating strips. The encapsulating strips are attached to each other by an adhesive. In a method for making such a security tag, a first encapsulating strip is provided, an anti-theft strip is placed on the first encapsulating strip, an adhesive is applied to the first encapsulating strip, and then a second encapsulating strip is provided and attached to the first encapsulating strip using the adhesive.

11 Claims, 6 Drawing Sheets



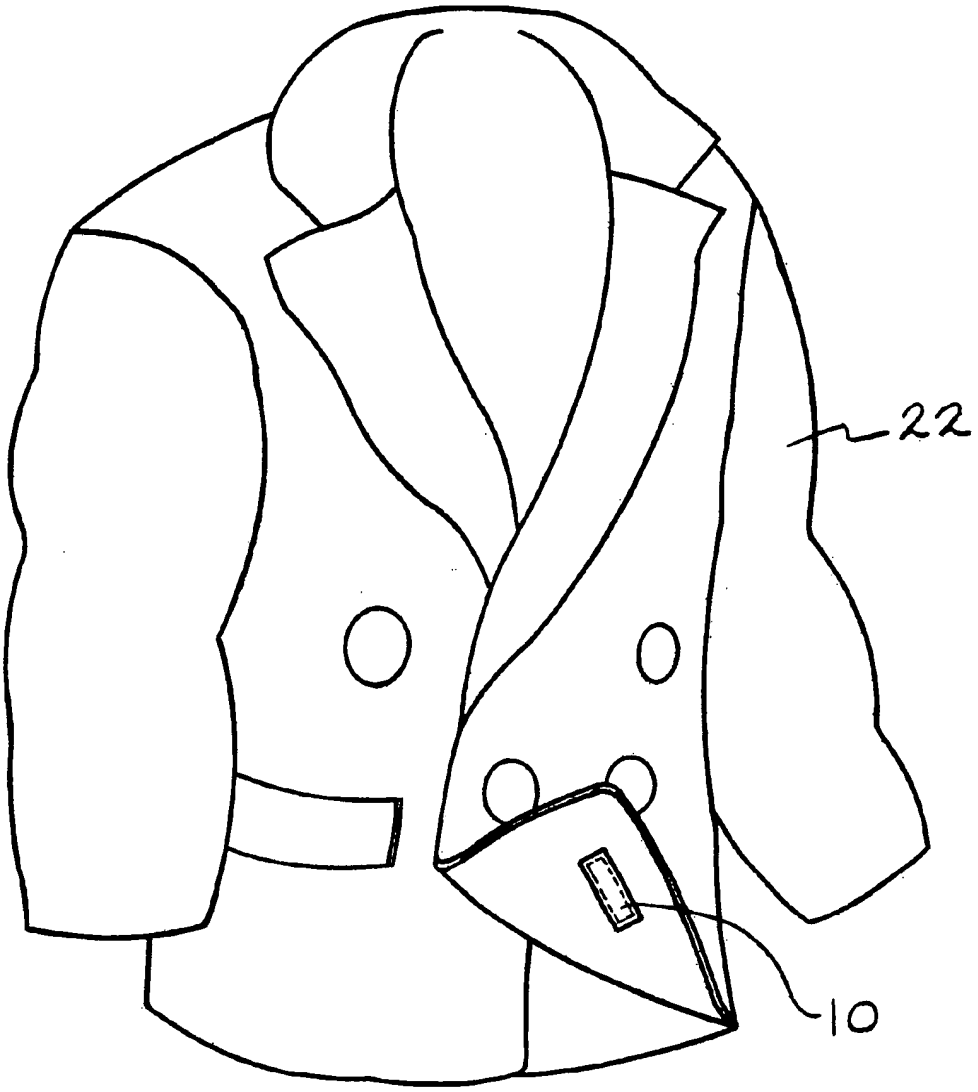


FIG. 1

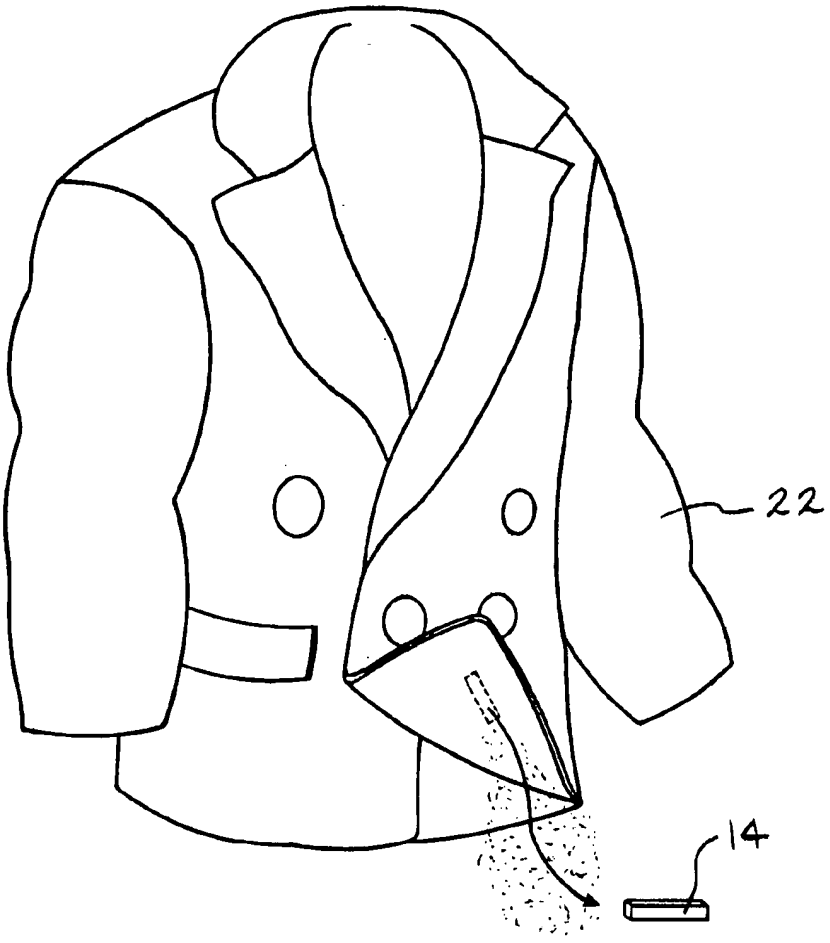


FIG. 2

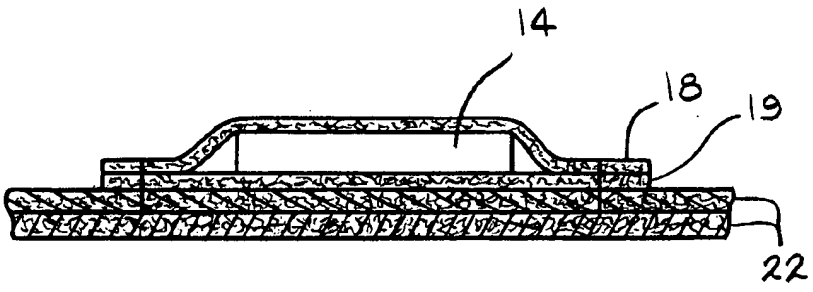


FIG. 3

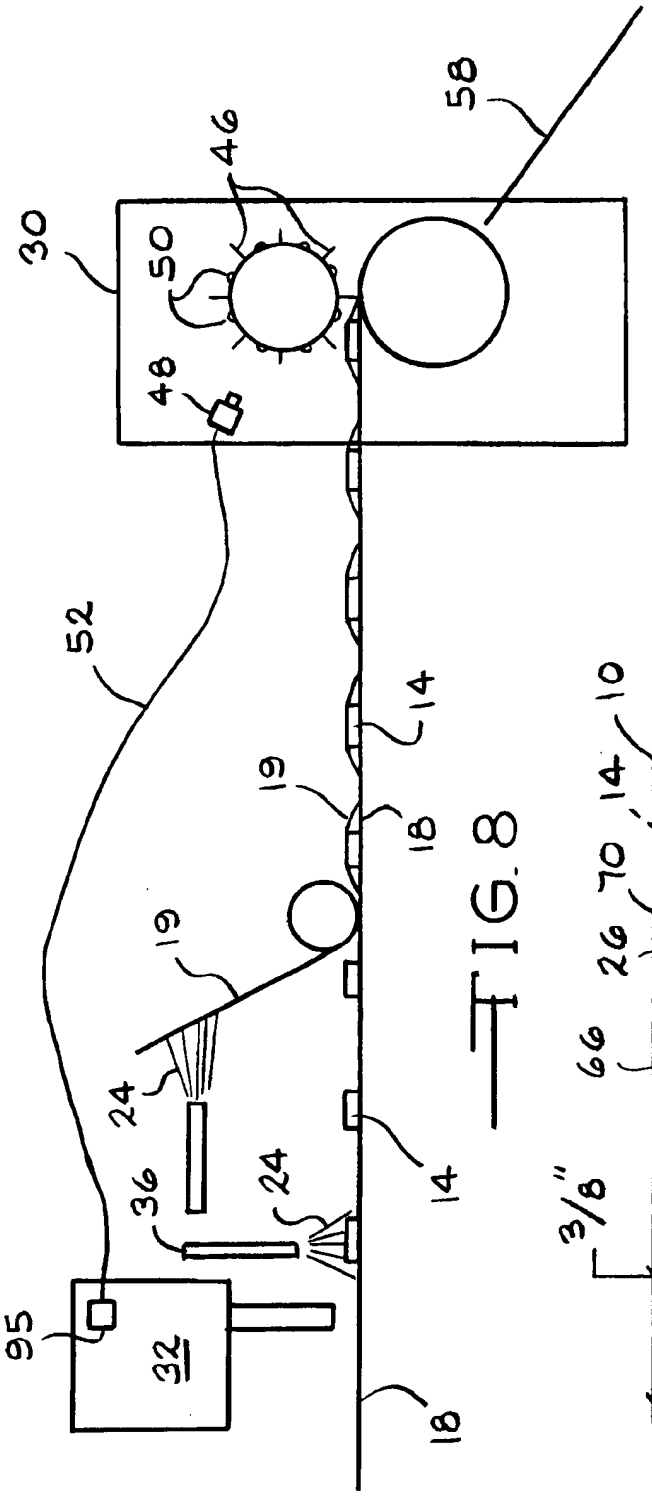

58
46
30
50
48
52
14
19
18
19
24
36
24
14
95
32
18

FIG. 8

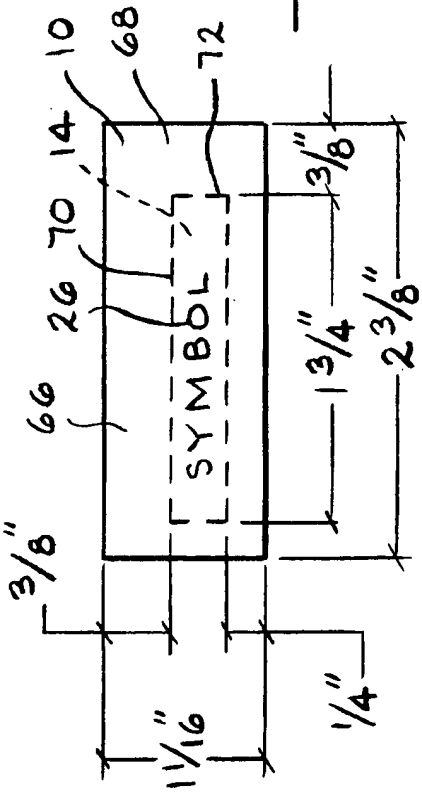

10
68
72
14
70
26
66
SYMBOL
3/8"
1 3/4"
2 3/8"
3/8"
1 1/16"
1/4"

FIG. 4

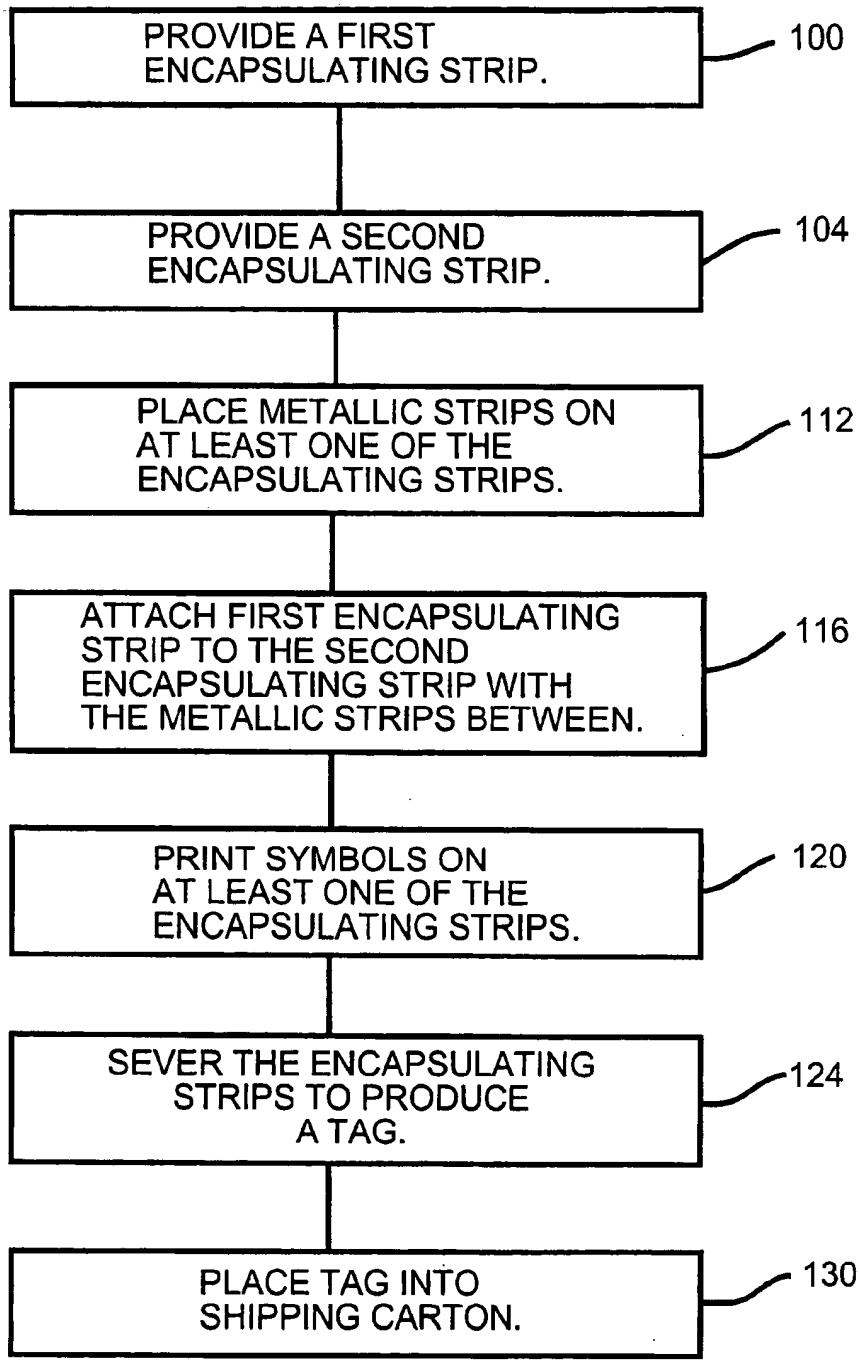

PROVIDE A FIRST ENCAPSULATING STRIP.
100
PROVIDE A SECOND ENCAPSULATING STRIP.
104
PLACE METALLIC STRIPS ON AT LEAST ONE OF THE ENCAPSULATING STRIPS.
112
ATTACH FIRST ENCAPSULATING STRIP TO THE SECOND ENCAPSULATING STRIP WITH THE METALLIC STRIPS BETWEEN.
116
PRINT SYMBOLS ON AT LEAST ONE OF THE ENCAPSULATING STRIPS.
120
SEVER THE ENCAPSULATING STRIPS TO PRODUCE A TAG.
124
PLACE TAG INTO SHIPPING CARTON.
130

FIG. 5

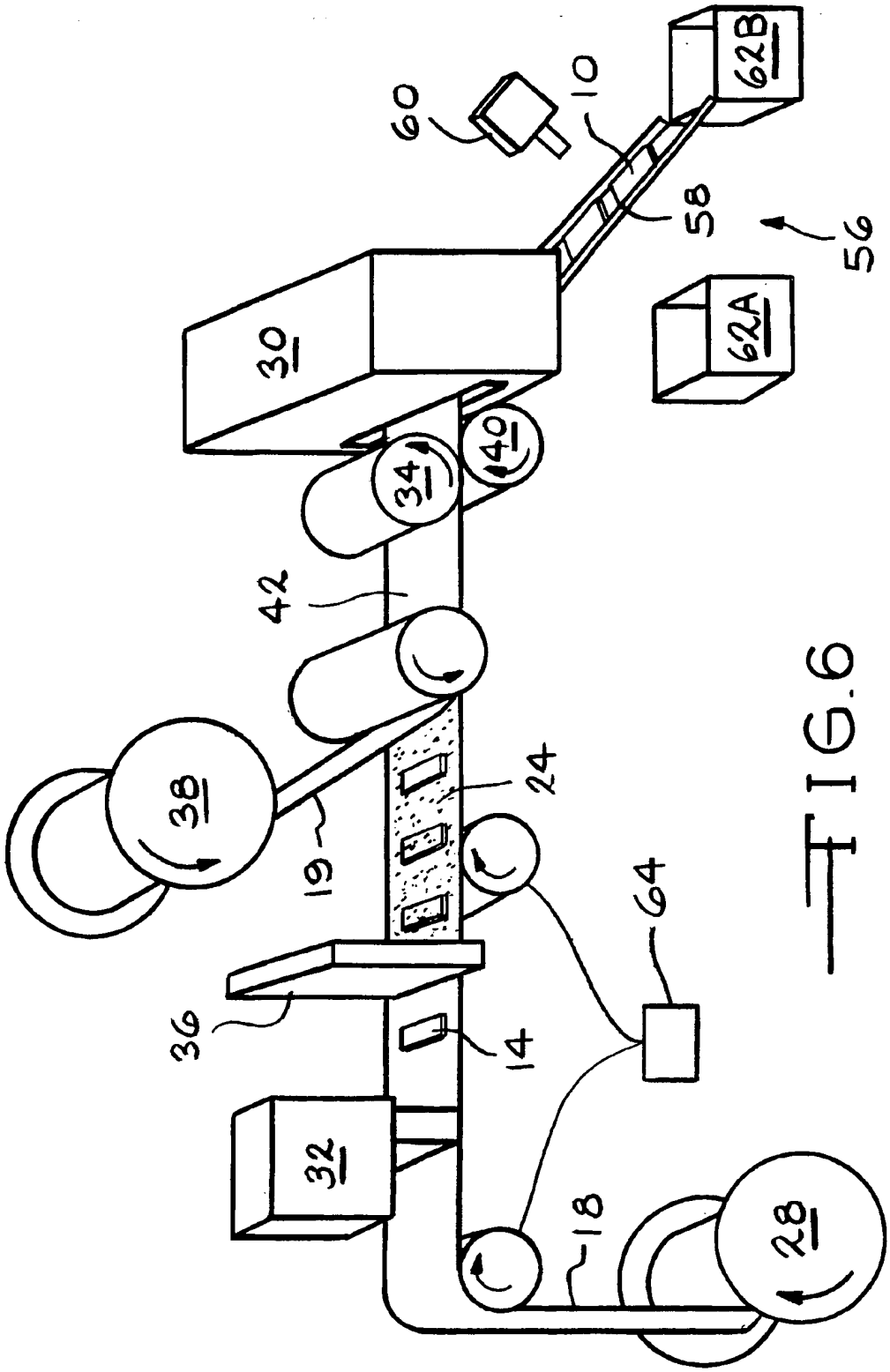


FIG.6

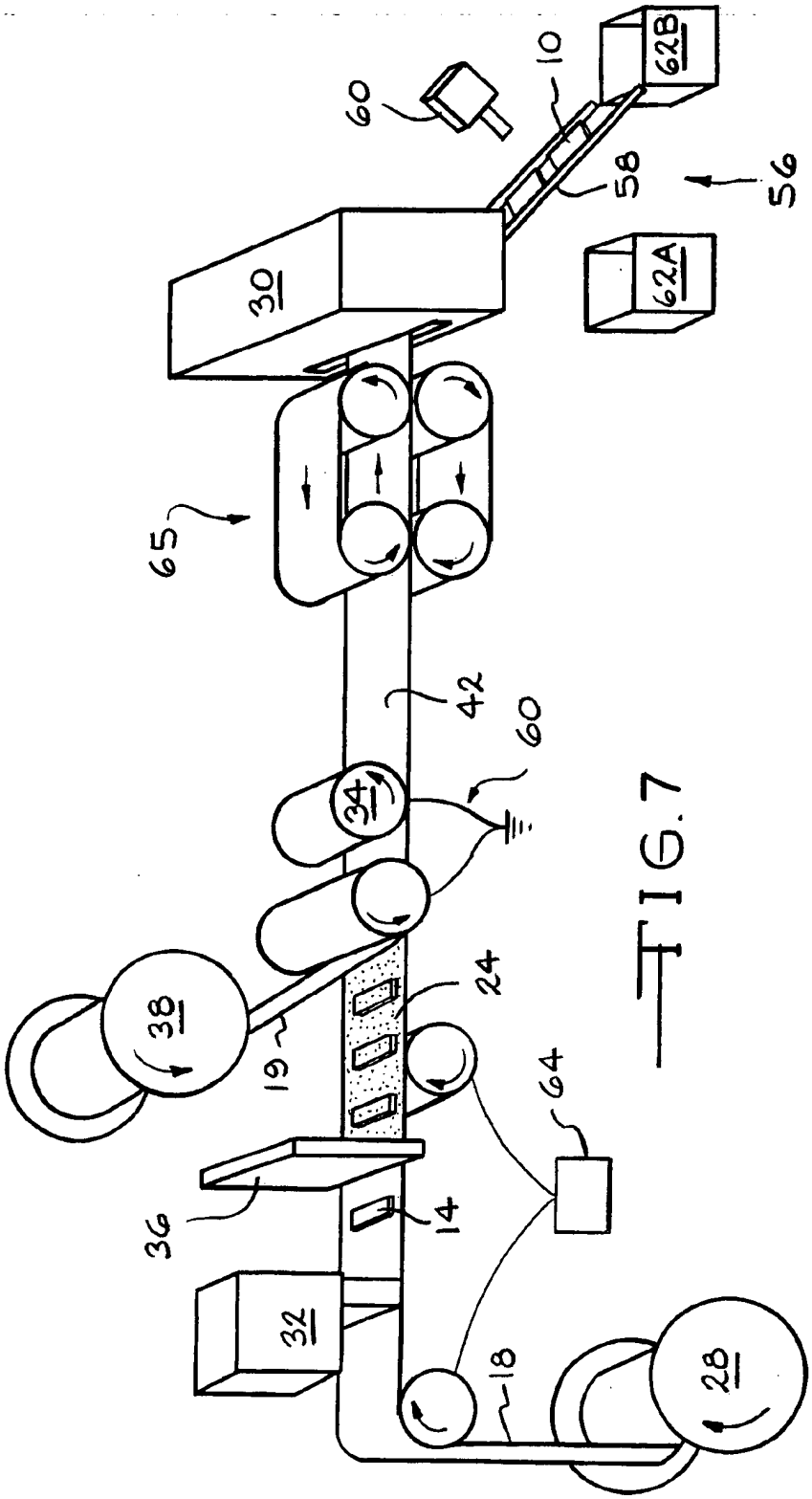


FIG. 7

SECURITY TAG AND METHOD OF MAKING THE SAME

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to an earlier filed U.S. provisional patent application having Ser. No. 60/127,893, which was filed on Apr. 6, 1999.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an improved security tag and a method of making such a security tag. The security tag of the present invention can be used with clothing or other articles in order to prevent theft, for example from a retail store.

2. Description of the Prior Art

It is known in the prior art to use a pair of metallic strips attached to an article to prevent theft of the article. In such anti-theft systems, a magnetic field is established at an exit of a retail store. When the metallic strips enter the magnetic field, the magnetic field is disturbed and the presence of the magnetic strips is thereby detected. Upon detection, an alarm is caused to sound.

In lieu of a magnetic based system, radio frequency systems are also commonly known. Such systems use a radio frequency detection and emission device ("RFDED") attached to an article. A first radio frequency is emitted near an exit of the retail store. When the first radio frequency is detected by the RFDED, the RFDED emits a second radio frequency, which is detected by an alarm system. RFDED's are commonly referred to as a "radio frequency resistor" and may be included with a device commonly referred to as a "radio frequency identification strip."

The magnetic strips, radio frequency resistor and radio frequency identification strip described above are examples of anti-theft devices commonly in use. After reading this disclosure, it will be apparent to those skilled in the art that the present invention is not limited to a magnetic strip, radio frequency resistor or a radio frequency identification strip. These three devices are merely examples of the types of anti-theft devices that may be used with the present invention. Since the commonly used anti-theft devices are usually contained on a strip, such devices are herein referred to as "anti-theft strips."

In some of the prior art methods and devices, the anti-theft strip is covered by a fabric-like material, and then the edges of the material are sealed by application of heat or ultrasonic vibrations to encapsulate the anti-theft strip within the material. Such a method and device is disclosed in U.S. Pat. No. 5,583,489. A problem with such prior art devices is that the fabric-like material which encapsulates the anti-theft strip is easily separated to remove the anti-theft strip and thereby defeat the security function of the anti-theft strip.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a security tag which holds the anti-theft strip in a secure manner.

Another object of the present invention is to provide a method of making the anti-theft strip according to the present invention.

Accordingly, the present invention includes an improved security tag and a method of making such a security tag. The security tag of the present invention includes two encapsulating strips, with an anti-theft strip between the encapsulating strips, and an adhesive for attaching the encapsulating strips to each other.

In the method of the present invention, a first encapsulating strip is provided, an anti-theft strip is placed on the first encapsulating strip, an adhesive is applied to at least one of the encapsulating strips, and then a second encapsulating strip is provided and pressed to the first encapsulating strip.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows an embodiment of the security tag of the present invention attached to an article of clothing;

FIG. **2** illustrates an embodiment of the present invention in which upon cleaning the article of clothing, the anti-theft strip will leave the article of clothing;

FIG. **3** is a cross-sectional view of the security tag according to the present invention attached to an article;

FIG. **4** is a top view of an embodiment of the security tag according to the present invention.

FIG. **5** is a flow chart showing steps of a method according to the present invention;

FIG. **6** is a perspective view of an apparatus for making the security tag according to the present invention;

FIG. **7** is a perspective view of another apparatus similar to that shown in FIG. **6** with a caterpuller added; and

FIG. **8** is a schematic of part of an apparatus for making the security tag according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is an improved security tag **10** and a method of making such a security tag **10**. As shown in FIGS. **1–3**, the security tag **10** has a means for providing security (herein referred to as an "anti-theft strip") **14**, such as a pair of metallic strips, held between two encapsulating strips **18,19**. As discussed above, other types of anti-theft strips **14** are known in the art, including radio frequency resistors and radio frequency identification strips, and the present invention is not limited to any particular anti-theft strip **14**.

One or both encapsulating strips **18,19** may be a flexible fabric. The flexible fabric may be woven, but a preferred flexible fabric is comprised of a blown fiber, and preferably includes polyester fibers. Such a blown fiber fabric is preferably comprised of 60% polyester, 39% cellulose and 1% polyvinyl alcohol. This preferred blown fiber fabric will allow a security tag **10** attached to an article **22** to be removed by tearing the encapsulating strips **18,19**.

The encapsulating strips **18,19** are attached to each other by an adhesive **24**. A preferred adhesive **24** is marketed under the trade name 3M 100 Fastbond Adhesive manufactured by the 3M Company located in Minnetonka, Minn. When the preferred adhesive **24** is used with the preferred blown fiber fabric, the adhesive **24** bonds the polyester fibers of the encapsulating strips **18,19** together to securely hold the anti-theft strip **14** between the encapsulating strips **18,19**.

The encapsulating strips **18,19** may be larger than the anti-theft strip **14** in order to provide a location for attaching the security tag **10** to the article **22**, such as an article of clothing. It is anticipated that a security tag **10** will be attached, for example by sewing, to the article **22**, but a security tag **10** may also be placed inside the article **22** without attaching the security tag **10** to the article **22**.

In an embodiment of the present invention, the adhesive **24** is water based so that the adhesive **24** will deteriorate

after repeated cleaning of the article **22**. One such adhesive **24** is the 3M 100 Fastbond Adhesive referenced above. When such an adhesive **24** is applied to only one of the encapsulating strips **18,19**, the encapsulating strips **18, 19** will separate after one or two cleanings and release the anti-theft strip **14**, as illustrated in FIG. **2**. However, if the adhesive **24** is applied to both encapsulating strips **18, 19**, many more cleanings are required to cause the encapsulating strips **18, 19** to separate.

FIG. **4** shows that a symbol **26**, such as a trade name, can be printed on one or both of the encapsulating strips **18,19**. Furthermore, one or both of the encapsulating strips **18,19** may be colored or sized as desired.

As shown in FIG. **5**, a method of making the security tag **10** according to the present invention may begin by a first providing step **100** wherein the first encapsulating strip **18** is provided, and a second-providing step **104** wherein the second encapsulating strip **19** is provided. The method also includes a placing step **112** during which an anti-theft strip **14** is placed on the first encapsulating strip **18**, and includes an attaching step **116** during which the second encapsulating strip **19** is attached to the first encapsulating strip **18**, so as to hold the anti-theft strip **14** between the first and second encapsulating strips **18,19**. In an embodiment of the method according to the present invention, the attaching step **116** includes applying an adhesive **24** to at least one of the encapsulating strips **18,19**. The adhesive **24** may be applied by an air atomizing low pressure spray gun, such as model number Mach 1A Automatic manufactured by ITW Binks, located in Chicago, Ill.

The steps of the method described above need not be done in the order described. For example, the adhesive **24** applied in the attaching step **116** may be applied prior to the placing step **112** wherein the anti-theft strip **14** is placed on at least one of the encapsulating strips **18,19**, or alternatively, may be applied after the placing step **112**.

In a preferred method according to the present invention a symbol **26** is printed (step **120**) on at least one of the encapsulating strips **18,19**. Finally, the encapsulating strips **18,19** are severed (step **124**) to produce a security tag **10**, and placed in a shipping carton (step **130**).

The method of the present invention can be practiced in a continuous process by an apparatus depicted in FIG. **6**. In an example of such a continuous process, a ribbon of the first encapsulating strip **18** is fed from a first spool **28** to a cutter **30**. As the first encapsulating strip **18** is fed to the cutter **30**, anti-theft strips **14** are placed on the first encapsulating strip **18** by a strip dispenser **32** at a rate of about between 150 to 300 anti-theft strips **14** per minute, preferably at a location on the first encapsulating strip **18** prior to the printing machine **34**. The strip dispenser **32** may be a wipe-on label application system, model number ALS-230R manufactured by Avery Dennison located in Hamburg, Germany.

As shown in FIG. **6**, after placing the anti-theft strip **14** on the first encapsulating strip **18**, the adhesive **24** is sprayed on a surface of the first encapsulating strip **18** by a sprayer **36**, and then a ribbon of the second encapsulating strip **19** preferably having a width about equal to the first encapsulating strip **18** is fed from a second spool **38** and positioned over the first encapsulating strip **18**, with adhesive **24** applied thereon, and over the anti-theft strip **14**. As suggested above, the second encapsulating strip **19** may be sprayed with adhesive **24**, for example, in the same manner as that described above with regard to the first encapsulating strip **18**. Then in an attaching step **116** the second encapsulating strip **19** is attached to the first encapsulating strip **18** and to the anti-theft strip **14**, preferably by pressing the first and second encapsulating strips **18,19** together to cause the adhesive **24** to adhere to both encapsulating strips **18,19**. The force required to press the encapsulating strips **18,19** may be provided by the printing machine **34** and an opposing roller **40**.

A surface **42** of either the first encapsulating strip **18**, or the second encapsulating strip **19**, or both, may then be subjected to the printing step **120** wherein a symbol **26** is printed by the printing machine **34** on one of the encapsulating strips **18,19**. After the printing step **120**, if any, the first and second encapsulating strips **18,19** are subjected to the severing step **124** wherein the encapsulating strips **18,19** are severed, for example by a cutter **30**, to produce individual security tags **10**. As shown in FIG. **8**, the cutter **30** may include a cylinder **44** with cutting blades **46** arranged thereon, which is commonly known in the industry as a rotary cutter, and can be obtained from Calmec Precision Limited, located in Mississauga, Ontario.

FIG. **8** shows an optical sensor **48** inside the cutter **30**. The optical sensor **48** detects marks on the cylinder **44** and sends a signal to the strip dispenser **32** via communication line **52**. Upon receiving the signal from the optical sensor **48**, the strip dispenser **32** is directed to dispense an anti-theft strip **14**. An adjustable delay circuit **95** may be included so that the strip dispenser **32** is directed to dispense an anti-theft strip **14** at a time after the signal from the optical sensor **48** is received. In this manner, the anti-theft strip **14** can be properly positioned within the encapsulating strips **18,19**, for example as shown in FIG. **4** and described above.

The security tags **10** are then sent to a packaging area **56**, which may include a diverter chute **58** and a unit counter **60**, for placing a predetermined number of the security tags **10** in a container **62B**. The diverter chute **58** may be movable so as to permit placement of the security tags **10** in either container **62A** or container **62B** without moving the containers **62A, 62B**. The unit counter **60** may include an optical sensing device such as model number E3SAD61, manufactured by Omron located in Japan. Alternatively, the strip dispenser **32** may include a counter, such as model number GEM20000 manufactured by Red Lion located in York, Pa.

It is contemplated that such a continuous process would need anti-static equipment **64** to protect the integrity of the anti-theft strip **14**. Such anti-static equipment **64** can be obtained from Calmec Precision Limited, located in Mississauga, Ontario.

The apparatus of FIG. **6** can be modified as shown in FIG. **7** by adding a caterpuller **65**. The caterpuller **65** is well known in the art, and can be obtained from Calmec Precision Limited, located in Mississauga, Ontario.

An example of the security tag **10** produced by the continuous process described above is shown in FIG. **4**. It is preferred that the anti-theft strip **14** be placed off center so as to leave wider areas **66,68** of the encapsulating strips **18,19** adjacent to two sides **70,72** of the anti-theft strip **14**. The wider areas **66,68** permit easy attachment of the security device **10** to an article **22**, for example by sewing the security device in the wider areas **66,68** to the article **22**. It should be noted that the dimensions of the security tag **10** shown in FIG. **4** are merely preferred dimensions that make the security tag **10** easy to apply with commonly used manufacturing equipment.

It is apparent that the present invention accomplishes the intended objects described above. The security tag of the present invention holds the anti-theft strip **14** in a secure manner, and the present invention provides a method of making the security tag.